Technical Notes

Registration The reporting of Kansas vital events to the Kansas Department of Health and Environment (KDHE) is mandated by law (K.S.A. 65-102, K.S.A. 65-2422b, K.S.A. 65-445). The filing of birth and death records was begun in 1911 and the registration of marriages and divorces was initiated in 1913 and 1951 respectively. The reporting of abortions began in 1970. Certificates of birth, death, stillbirth, marriage, marriage dissolution, and reports of abortion are completed by the combined efforts of physicians, hospital personnel, funeral directors, and local courts. All certificates and reports are filed with the Office of Vital Statistics by direct reporting. Since registration of vital events began, over ten million records have been processed, filed and indexed.

2005 Revisions to Certificates Beginning with the reporting of 2005 data, Kansas implemented the latest revision of the U.S. standard certificates and reports. The new data collection instruments are referenced on pages 153-165.

Please note that not all states have implemented the use of the new certificate format. Therefore, items which were added or significantly revised will most likely not have information provided for Kansas residents who had events in another state.

While most data items on the certificates are comparable to past years, certain items have changed considerably. These changes can affect comparability with previous years data.

Prenatal care visits In previous years, the mother or prenatal care provider reported the month of pregnancy in which the mother began prenatal care. As of 2005, this item was replaced by the exact dates of first and last prenatal visit. Therefore, the month prenatal care began is now calculated from the last normal menses date and the date of first prenatal care visit. Accordingly, prenatal care data in this report (Tables 14-15, Figure 17) is not directly comparable to data collected from previous certificates.

Race-Ethnicity The revised certificates contain significant changes in the way self-reported race and ethnicity is collected. The race item was revised to allow the reporting of multiple races and can capture up to 15 categories and eight literal entries. In addition, Hispanic origin is now collected as a separate question from ancestry. These changes were implemented to provide a better picture of the nation's variation in race and ethnicity. The expanded racial and ethnic categories are compliant with the provisions to the Statistical Policy Directive No. 15, Race and Ethnic Standards for Federal Statistics and Administrative Reporting, issued by the Office of Management and Budget (OMB) in 1997. Under these guidelines when race and ethnicity are collected separately, Hispanic ethnicity is collected first on the certificate.

For this report, the self-reported single race data is utilized for White, Black, Native American, Asian, Native Hawaiian – other Pacific Islander and Other. If more than one racial category is checked, the person's race is classified as "Multiple."
The U.S. Census Bureau adopted the new race standards for use in the 2000 decennial census. The Census Bureau also prepares its annual population estimates using the new standards. Those estimates are used as the

denominator in calculating population–based rates by race for selected 2005 vital events (Figure 4) in this report.

Before the new multiple race formats were used on Kansas certificates (2002 to 2004) it was necessary to use specially prepared population estimates in which persons of Hawaiian, or Pacific Islander race or of multiple race were bridged or collapsed into the four categories of White, Black, American Indian/Alaska Native, and Asian. The Census Bureau prepared the bridged race data using methodology developed by the National Center for Health Statistics. Since the census annual population estimates that are based on the new race standard do not have the specific age groups needed for teen pregnancy, the bridged race dataset must be used for these calculations (Table 22).

Quality of Data The quality of the analyses in the *Annual Summary of Vital Statistics* depends on the accuracy of the Kansas vital statistics data. The Office of Vital Statistics makes every effort to ensure the completeness and accuracy of the certificates filed. An exchange agreement with all 57 registration states/jurisdictions and Canada ensures that vital events occurring to Kansas residents in other states or Canada are recorded. Tabulation of vital events for 2005 in-state and out-of-state occurrences is maintained through June 1, 2006. Reports filed later consist of less than one percent of the total reports filed, are considered negligible, and are omitted from this report.

The tabulation of divorce statistics is impacted by the completeness of reporting by District Courts in Kansas. Despite efforts to assure 100 percent reporting compliance, it has been determined by the Center for Health and Environmental Statistics (CHES) that not all divorce and annulment certificates have been filed with the Center. The Center is unable to estimate how incomplete the reporting is. Users of marriage dissolution data should exercise caution before making any conclusions based on these data. The Center is obligated to report the data it collects, but recommends that any marriage dissolution data findings be accompanied by a statement that totals may not represent 100 percent of this vital event due to under-reporting.

Residence vs Occurrence Data Residence data is information compiled according to the usual residence regardless of where the event occurred (including events occurring out-of-state). Occurrence data is information compiled according to the geographical location where the event took place, regardless of the actual residence. Information compiled for births, stillbirths, and deaths in this report are residence data, while marriages and marriage dissolutions are occurrence data and abortions are all reported (residence and occurrence).

Peer Groups For various demographic studies, it is useful to consider groups of counties with similar characteristics. “Peer Groups” of counties, as used in this summary, are defined as those with similar population density based on their 2000 actual census counts. In order to facilitate a time series comparison the assignment of counties to their peer group remains unchanged until the next decennial census. They will not necessarily have similar values for any other indicators. Frontier counties are defined as those with less than 6.0 persons per square mile, Rural counties as those with 6.0 - 19.9 persons per square mile, Densely-Settled Rural counties as those with 20.0 - 39.9 persons per square mile, Semi-Urban counties as those with 40.0 - 149.9 persons per square mile, and Urban counties as those with 150.0 or more persons per square mile. These definitions originated with the Kansas Department of Health and Environment, Office of Local and Rural Health, and should *not* be confused with the U.S. Census Bureau’s (USCB) definitions of urban and rural areas. Sources for calculation of population densities are population figures from the 2000 U.S. Census and land areas from the 2000 U.S. Census.

Counties are grouped in population density peer groups as follows:

Frontier
Barber
Chase
Cheyenne
Clark
Comanche
Decatur
Edwards
Elk
Gove
Graham
Greeley
Hamilton
Hodgeman
Jewell
Kearny
Kiowa
Lane
Lincoln
Logan
Meade
Morton
Ness
Osborne
Rawlins
Rush
Sheridan
Smith
Stanton
Trego
Wallace
Wichita

Rural
Anderson
Brown
Chautauqua
Clay
Cloud
Coffey
Ellsworth
Grant
Gray
Greenwood
Harper
Haskell
Jackson
Kingman
Linn
Marion
Marshal
Mitchell
Morris
Nemaha
Ottawa
Pawnee
Phillips
Pratt
Republic
Rice
Rooks
Russell
Scott
Sherman
Stafford
Stevens
Thomas
Wabaunsee
Washington
Wilson
Woodson

Densely-Settled Rural
Allen
Atchison
Barton
Bourbon
Cherokee
Cowley
Dickinson
Doniphan
Ellis
Finney
Ford
Jefferson
Labette
McPherson
Neosho
Osage
Pottawatomie
Seward
Sumner

Semi-Urban
Butler
Crawford
Franklin
Geary
Harvey
Leavenworth
Lyon
Miami
Montgomery
Reno
Riley
Saline

Urban
Douglas
Johnson
Sedgwick
Shawnee
Wyandotte

Population State, county, and city population estimates for 2001-2005 were produced by the USCB and certified by the Kansas Division of the Budget. These estimates are on the Kansas Division of the Budget website at: http://da.state.ks.us/budget/ecodemo.htm.

Population estimates by age-group and sex for 1996 were obtained from the Census and You, Vol. 32, No. 7, July, 1997 USCB. Population estimates for 1997-1999 were obtained on the internet at: http://eire.census.gov/popest/archives/1990.php. Population counts for 2000 were obtained on the internet at http://www.census.gov/main/www/cen2000.html.

Population by age-group and sex was not available from the USCB for 2001 and was estimated by the Kansas Department of Health and Environment based on 2000 USCB numbers. Population estimates for 2002-2004 were obtained from the Bridged-race Vintage 2002, 2003, 2004 and 2005 postcensal series by year, age, sex, race, and Hispanic origin, prepared under a collaborative arrangement between the National Center for Health Statistics (NCHS) and the USCB. The population data are at the Centers for Disease Control and Prevention website at:

http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm. These numbers were used in age-specific and age-adjusted calculations. Race-specific birth and death rates (Figure 4) for 2005 are based on U.S. Census estimates that comply with the new race standards and can be obtained on the Internet at: http://www.census.gov/popest/estimates.php.

Due to rounding and variation in estimation methods within the USCB, some discrepancies may be found in population data. (Tables 2 and 4) Usually differences are negligible and rarely result in discrepancies in the totals. We advise you to utilize state totals from the county population totals when a total population estimate is needed.

Female Population 10-19 Estimates of the Kansas female population for 1996-1999 were obtained from the USCB, and actual population counts were used for 2000.

The 2001 state and county estimates for teenage females (10-14, 10-17, 15-19, 10-19) were compiled by the KDHE based on 2000 USCB numbers. In order to estimate the 2001 teenage female population for the various age groupings, the 2000 proportion for the age grouping within the total population had to be derived. These estimates were calculated as in the following example for 2001.

$$\frac{\text{Female Population 10-14 Year Age Group (2000)}}{\text{2000 Population All Ages}} \times \text{2001 Population All Ages} = \text{10-14 Year Age-Group (2001)}$$

The 2002-2005 estimates were prepared by the USCB in collaboration with the NCHS. (See above reference)

Deaths Underlying causes of death in the *2005 Annual Summary of Vital Statistics* are established through a system known as the International Classification of Diseases, 10th Revision (ICD-10). This system promotes uniformity and comparability in the collection and presentation of mortality or death data. Prior to 1999, Kansas used ICD-9 to report mortality statistics. Periodically the classification system needs to be updated to address new diseases and reflect a better understanding of causes of death. The World Health Organization maintains ICD-10 and the NCHS, which compiles national statistics, modifies ICD-10 for use by Kansas and other states.

One of the challenges in the conversion to a new classification system is comparability with statistics compiled under the old system. Because so much has changed, exact comparison is not possible. Not only have the number of causes of death doubled to over 8,000, but the rules of how a death is coded have changed. Greater knowledge of diseases like Alzheimer's and diabetes has resulted in coding rule changes that increased the number of cases reported. The rule changes may also lower the number of deaths classified as pneumonia and influenza. Death data from 1999 forward are classified by ICD-10, and trends in mortality will be comparable.

In accordance with NCHS guidelines, fetal deaths that were coded Symptoms, Signs & Abnormal Findings (R00 - R99) are now coded unspecified cause (P95).

Age-Adjusted Death Rates Mortality rates, the number of deaths per 100,000 population, are a common way to report death statistics so that comparisons can be

made from year to year or among geographic areas. Crude death rates compensate for the differences in population within the areas or time periods studied. Crude death rates, however, do not compensate for the different age make up of compared populations. For example, some Kansas counties may have more older residents than other counties. To address this, statisticians prepare age-adjusted death rates. The direct method for calculating age-adjusted death rates was used in this report. Age-adjusting is a process by which the age composition of a population is defined as constant so that differences in age composition can be eliminated from the analysis. This is needed because older populations have higher death rates, merely because death rates increase with age. Age-adjusted rates allow for more meaningful comparison of the risk of mortality over time and among groups.

For this report, age-adjusted death rates were calculated using the 2000 population standard. Kansas began using the 2000 population standard, as recommended by NCHS, in the *1999 Annual Summary of Vital Statistics*. As part of its implementation of the new age-adjusting population standard, CHES produced the report *Age Standardization of Kansas Death Rates: Implications of the Year 2000 Standard.* Copies can be obtained at the CHES Web site http://www.kdheks.gov/ches/.

Years of Potential Life Lost (YPLL) The YPLL, for this report, is a measurement of the number of years of potential life lost by each death occurring before the average life expectancy. This calculation provides more information on the societal impact of mortality. Years of life lost counts deaths at a younger age more heavily than those at older ages (e.g., the younger person has a greater potential for years left than an elderly person). YPLL were calculated by subtracting mid-point years of the 5-year age-groups from life expectancies for all Kansans and male and female Kansans. The subtraction leaves a remainder - the years of potential life lost, which is then multiplied by the number of deaths in that particular age-group and subsequently all calculations for the five-year age-groups beginning with 0-4 and through over 85 are summed to provide the total years of life lost. In making the calculations, the age-groups with mid-points larger than the life expectancy were set to zero because they would not contribute years of life lost (e.g., they are over the life expectancy). For this report, the life expectancy for all Kansans is 77.4 years, males 74.9 and females 79.8 years. These 2000 life expectancies were prepared by the KDHE CHES. Since the *1992 Annual Summary of Vital Statistics*, CHES has used 1990 life tables prepared by the Kansas Division of the Budget. In an effort to update this data CHES prepared the report *Abridged Life Tables, Kansas, 2000*. Copies can be obtained on the CHES website at: http://www.kdheks.gov/ches/research.html.

Rate Reliability Vital statistics are easily influenced by random variation and single-year rates can fluctuate from year to year. A multiple-year rate such as a five- or ten-year average of single-year rates would be more accurate in formulating conclusions on vital events. For example, between 2001 and 2005 the infant death rate for Kansas ranged from 6.7 to 7.5, while the 2001-2005 five-year infant death rate for Kansas was 7.2 infant deaths per 1,000 live births. A five or ten-year rate smooths some of the variation in single-year rates and would be a more reliable indicator of infant death rates in Kansas.

Rates based on a small or large number of events in a sparsely populated area can vary widely. To exemplify the variation that may occur with a small change in the number of events, in 2005 Greeley county was the least populated county in Kansas with 1,349 residents and Johnson county was the largest with 506,562 residents. With 17 deaths occurring in Greeley county in 2005, the crude death rate was 12.6 deaths per 1,000

Population; whereas 3,098 deaths occurring in Johnson county resulted in a crude death rate of 6.1 deaths per 1,000 population. If five more deaths occurred in each county (e.g., multiple- death accident), Greeley county's crude death rate would have increased to 16.3, while Johnson county's rate would have increased by only a few hundredths and, with rounding, still remain 6.1 deaths per 1,000 population. Therefore, one must use caution when comparing rates of vital events between counties of extreme population size differences to avoid misleading conclusions.

Limitations of Pregnancy Outcome Data From July,1970 through June,1995, only hospitals in Kansas were required by K.S.A. 65-445 to keep and submit to the Secretary of the Department of Health and Environment written records of all pregnancies terminated in the hospital. During this reporting period, nonhospital providers reported terminations only on a voluntary basis. Although Kansas had a comprehensive coverage of providers, there could have been a small number of abortions not reported. This means that the data may have been, to a certain degree, underreported. However, effective July 1, 1995, the Kansas legislature amended K.S.A. 65-445 in Senate Bill 384 to broaden the record-keeping and reporting requirement to include every medical care facility and every person licensed to practice medicine and surgery.

Criteria for the Adequacy of Prenatal Care Utilization (APNCU) INDEX

I. Month prenatal care began (Adequacy of Initiation of Prenatal Care)

Adequate Plus: 1st or 2nd month
Adequate: 3rd or 4th month
Intermediate: 5th or 6th month
Inadequate: 7th month or later, or no prenatal care

II. Proportion of the number of visits recommended by the American College of Obstetricians and Gynecologists (ACOG) received from the time prenatal care began until delivery (Adequacy of Received Services)

Adequate Plus: 110% or more
Adequate: 80% - 109%
Intermediate: 50% - 79%
Inadequate: less than 50%

III. Summary Adequacy of Prenatal Care Utilization Index

Adequate Plus: Prenatal care begun by the 4th month and 110% or more of recommended visits received
Adequate: Prenatal care begun by the 4th month and 80% - 109% of recommended visits received
Intermediate: Prenatal care begun by the 4th month and 50% - 79% of recommended visits received
Inadequate: Prenatal care begun after the 4th month or less than 50% of recommended visits received

The bibliographic reference relating to this index is: Kotelchuck, Milton. "An Evaluation of the Kessner Adequacy of Prenatal Care Index and a Proposed Adequacy of Prenatal Care Utilization Index.", *American Journal of Public Health*, 1994; 84(9): 1414-1420.

Handling of Unknowns Items for which no response was provided are shown as "not stated" (N.S.) in the tables and graphs throughout this publication. To ensure the accuracy of the data, the "not stated" have been removed from totals when calculating percentages.